

the condition of education 2006



INDICATOR 18

Science Performance of Students in Grades 4, 8, and 12

The indicator and corresponding tables are taken directly from *The Condition of Education 2006*. Therefore, the page numbers may not be sequential.

Additional information about the survey data and supplementary notes can be found in the full report. For a copy of *The Condition of Education 2006*, visit the NCES website (<http://nces.ed.gov/pubsearch/pubsinfo.sap?pubid=2006071>) or contact ED PUBs at 1-877-4ED-PUBS.

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Academic Outcomes

Science Performance of Students in Grades 4, 8, and 12

In 2005, the average science score of students was higher than in previous assessment years at grade 4, was not measurably different at grade 8, and was lower at grade 12 than in 1996.

The National Assessment of Educational Progress (NAEP) has assessed the science abilities of students in grades 4, 8, and 12 in both public and private schools since 1996, using a separate 0–300 scale for each grade. Between 1996 and 2005, the national average 4th-grade science score increased from 147 to 151; there was no measurable change in the 8th-grade score; and the 12th-grade score decreased from 150 to 147 (see supplemental table 18-1).

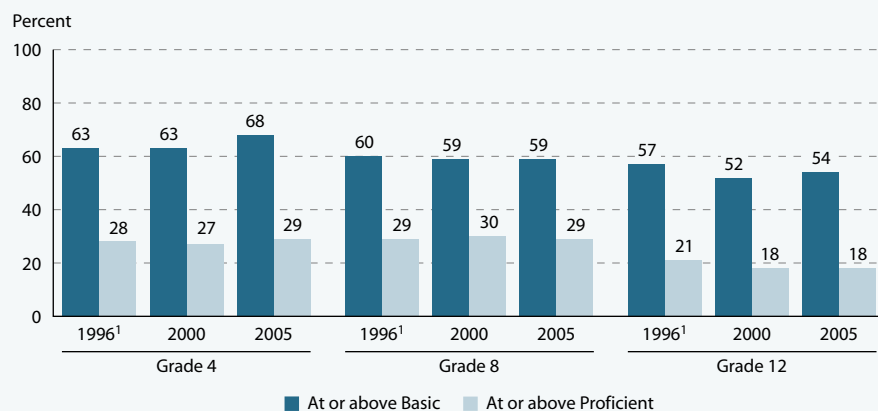
Achievement levels (*Basic*, *Proficient*, and *Advanced*), which identify what students should know and be able to do at each grade, provide another measure of student performance. The percentages of 4th- and 8th-graders at or above *Proficient* (indicating solid academic achievement) were not measurably different from 1996 to 2005, while the percentage of 12th-graders at or above this achievement level decreased. In 2005, 29 percent of 4th- and 8th-graders and 18 percent of 12th-graders were at or above *Proficient*.

Certain subgroups outperformed others in science in 2005. For example, males out-

performed females at all three grades. Male 4th-graders had a higher average score in 2005 than in 1996, and both male and female 12th-graders had lower scores in 2005 than in 1996 (see supplemental table 18-2). White students scored higher, on average, than Black and Hispanic students at all three grades in 2005. At 4th grade, average scores increased for White, Black, Hispanic, and Asian/Pacific Islander students between 1996 and 2005. At 8th grade, the average score for Black students increased, but the scores were not measurably different for other racial/ethnic groups. At 12th grade, there were no measurable differences in average scores for any racial/ethnic group during this period.

NAEP results also permit comparisons among states of the science abilities of 4th- and 8th-graders in public schools over time. At grade 4, of the 36 states that participated in both the 2000 and 2005 assessments, average science scores increased in 9 states (see supplemental table 18-3). At grade 8, of the 36 states that participated in 1996 and 2005, average scores increased in 8 states and decreased in 5 states.

SCIENCE PERFORMANCE: Percentage of students performing at or above Basic and at or above Proficient in science, by grade: 1996, 2000, and 2005



¹ Testing accommodations (e.g., extended time, small group testing) for children with disabilities and limited-English-proficient students were not permitted on the 1996 science assessment.

SOURCE: Grigg, W., Lauko, M., and Brockway, D. (2006). *The Nation's Report Card: Science 2005* (NCES 2006-466), figure 1. Data from U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996, 2000, and 2005 Science Assessments.

FOR MORE INFORMATION:
Supplemental Notes 1, 4
Supplemental Tables 18-1,
18-2, 18-3



Science Performance of Students in Grades 4, 8, and 12

Table 18-1. Average science score by percentile and percentage of students at each achievement level, by grade: 1996, 2000, and 2005

Percentile and achievement level	Grade 4			Grade 8			Grade 12		
	1996 ¹	2000	2005	1996 ¹	2000	2005	1996 ¹	2000	2005
Average score									
Total	147	147	151	149	149	149	150	146	147
Percentile²									
10th	99	99	109	103	101	101	105	101	101
25th	125	125	130	127	126	126	128	124	125
50th	150	150	153	152	152	151	152	148	149
75th	172	172	173	174	175	174	174	170	171
90th	190	190	189	192	194	192	192	189	189
Percentage at achievement level									
Achievement level									
Below Basic	37	37	32	40	41	41	43	48	46
At or above Basic	63	63	68	60	59	59	57	52	54
At or above Proficient	28	27	29	29	30	29	21	18	18
At Advanced	3	3	3	3	4	3	3	2	2

¹ Testing accommodations (e.g., extended time, small group testing) for children with disabilities and limited-English-proficient students were not permitted on the 1996 science assessment.

² A percentile indicates the percentage of students whose scores fell at or below a particular score. Thus the 10th and 25th percentiles represent lower scoring students; the 50th percentile represents middle-scoring students; and the 75th and 90th percentiles represent higher scoring students.

NOTE: See *supplemental note 4* for more information on the National Assessment of Educational Progress (NAEP).

SOURCE: Grigg, W., Lauko, M., and Brockway, D. (2006). *The Nation's Report Card: Science 2005* (NCES 2006-466), figures 1 and 17 and previously unpublished tabulation (January 2006). Data from U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996, 2000, and 2005 Science Assessments.

Science Performance of Students in Grades 4, 8, and 12

Table 18-2. Average science score for 4th-, 8th-, and 12th-graders, by selected student characteristics: 1996, 2000, and 2005

Characteristic	Grade 4			Grade 8			Grade 12		
	1996 ¹	2000	2005	1996 ¹	2000	2005	1996 ¹	2000	2005
Total	147	147	151	149	149	149	150	146	147
Sex									
Male	148	149	153	150	153	150	154	148	149
Female	146	145	149	148	146	147	147	145	145
Race/ethnicity ²									
White	158	159	162	159	161	160	159	153	156
Black	120	122	129	121	121	124	123	122	120
Hispanic	124	122	133	128	127	129	131	128	128
Asian/Pacific Islander	144	—	158	151	153	156	147	149	153
American Indian	129	135	138	148	147	128	144	151	139
Parents' education									
Less than high school	—	—	—	—	—	128	—	—	125
High school diploma or equivalent	—	—	—	—	—	138	—	—	136
Some college	—	—	—	—	—	151	—	—	148
Bachelor's degree or higher	—	—	—	—	—	159	—	—	157
Eligible for free or reduced-price lunch									
Eligible	129	127	135	129	127	130	—	—	—
Not eligible	159	158	162	156	159	159	—	—	—
Information not available	151	160	160	157	155	160	—	—	—

— Not available.

¹ Testing accommodations (e.g., extended time, small group testing) for children with disabilities and limited-English-proficient students were not permitted on the 1996 science assessment.

² Black includes African American, Hispanic includes Latino, Pacific Islander includes Native Hawaiian, and American Indian includes Alaska Native. Race categories exclude Hispanic origin unless specified.

NOTE: See *supplemental note 4* for more information on the National Assessment of Educational Progress (NAEP).

SOURCE: Grigg, W., Lauko, M., and Brockway, D. (2006). *The Nation's Report Card: Science 2005* (NCES 2006-466), figures 4, 6, 8, and 10–16. Data from U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996, 2000, and 2005 Science Assessments.

Science Performance of Students in Grades 4, 8, and 12

Table 18-3. Average science score for public school 4th- and 8th-graders, by state: 1996, 2000, and 2005

State	Grade 4		1996 ¹	Grade 8	
	2000	2005		2000	2005
United States	145*	149	148	148	147
Alabama	143	142	139	143*	138
Arizona	140	139	145*	145*	140
Arkansas	145	147	144	142	144
California	129*	137	138	129*	136
Colorado	—	155	155	—	155
Connecticut	156	155	155	153	152
Delaware	—	152	142*	—	152
Florida	—	150	142	—	141
Georgia	142*	148	142	142	144
Hawaii	136*	142	135	130*	136
Idaho	152	155	—	158	158
Illinois	150	148	—	148	148
Indiana	154	152	153	154*	150
Kentucky	152*	158	147*	150*	153
Louisiana	139	143	132*	134*	138
Maine	161	160	163*	158	158
Maryland	145*	149	145	146	145
Massachusetts	161	160	157*	158*	161
Michigan	152	152	153	155	155
Minnesota	157	156	159	159	158
Mississippi	133	133	133	134	132
Missouri	157	158	151	154	154
Montana	160	160	162	164	162
Nevada	142	140	‡	141*	138
New Hampshire	—	161	‡	—	162
New Jersey	—	154	‡	—	153
New Mexico	140	141	141*	139	138
North Carolina	147	149	147	145	144
North Dakota	160	160	162	159*	163
Ohio	155	157	—	159	155
Oklahoma	151	150	—	149	147
Oregon	148	151	155	154	153
Rhode Island	148	146	149*	148	146
South Carolina	140*	148	139*	140*	145
South Dakota	—	158	—	—	161
Tennessee	145*	150	143	145	145
Texas	145*	150	145	143	143
Utah	154	155	156*	154	154
Vermont	160	160	157*	159*	162
Virginia	155*	161	149*	151*	155

See notes at end of table.

Science Performance of Students in Grades 4, 8, and 12

Table 18-3. Average science score for public school 4th- and 8th-graders, by state: 1996, 2000, and 2005—Continued

State	Grade 4		Grade 8		
	2000	2005	1996 ¹	2000	2005
Washington	—	153	150*	—	154
West Virginia	149	151	147	146	147
Wisconsin	‡	158	160	‡	158
Wyoming	156	157	158	156*	159

— Not available.

‡ Reporting standards not met.

* Significantly different from 2005 ($p < .05$).

¹ Testing accommodations (e.g., extended time, small group testing) for children with disabilities and limited-English-proficient students were not permitted on the 1996 science assessment.

NOTE: At the state level, the National Assessment of Educational Progress (NAEP) includes only students in public schools, while other reported national results in this indicator include both public and private school students. Variations or changes in exclusion rates for students with disabilities and limited-English-proficient students in the NAEP samples may affect comparative performance results. See *supplemental note 4* for more information on testing accommodations and NAEP.

SOURCE: Grigg, W., Lauko, M., and Brockway, D. (2006). *The Nation's Report Card: Science 2005* (NCES 2006-466), tables 2 and 3. Data from U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996, 2000, and 2005 Science Assessments.

Science Performance of Students in Grades 4, 8, and 12

Table S18. Standard errors for the percentage of students performing at or above Basic and at or above Proficient in science, by grade: 1996, 2000, and 2005

Achievement level	Grade 4			Grade 8			Grade 12		
	1996	2000	2005	1996	2000	2005	1996	2000	2005
At or above Basic	1.4	1.2	0.4	1.0	1.2	0.4	1.0	1.2	0.8
At or above Proficient	1.0	0.9	0.4	0.9	1.0	0.3	0.8	0.9	0.6

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996, 2000, and 2005 Science Assessments, previously unpublished tabulation (January 2006).

Science Performance of Students in Grades 4, 8, and 12

Table S18-1. Standard errors for the average science score by percentile and percentage of students at each achievement level, by grade: 1996, 2000, and 2005

Percentile and achievement level	Grade 4			Grade 8			Grade 12		
	1996	2000	2005	1996	2000	2005	1996	2000	2005
Average score									
Total	1.1	0.9	0.3	0.8	1.0	0.3	0.7	0.9	0.6
Percentile									
10th	2.1	1.7	0.5	1.5	1.2	0.6	1.4	1.4	1.2
25th	1.6	1.4	0.4	1.2	1.3	0.4	1.1	1.0	0.8
50th	1.2	0.9	0.4	0.7	0.9	0.3	1.2	1.0	0.8
75th	1.0	0.7	0.3	0.8	0.8	0.3	0.8	1.2	0.8
90th	0.8	1.0	0.3	0.8	1.0	0.3	0.9	1.2	1.2
Percentage at achievement level									
Achievement level									
Below Basic	1.4	1.2	0.4	1.0	1.2	0.4	1.0	1.2	0.8
At or above Basic	1.4	1.2	0.4	1.0	1.2	0.4	1.0	1.2	0.8
At or above Proficient	1.0	0.9	0.4	0.9	1.0	0.3	0.8	0.9	0.6
At Advanced	0.3	0.4	0.1	0.3	0.3	0.1	0.3	0.3	0.2

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996, 2000, and 2005 Science Assessments, previously unpublished tabulation (January 2006).

Science Performance of Students in Grades 4, 8, and 12

Table S18-2. Standard errors for the average science score for 4th-, 8th-, and 12th-graders, by selected student characteristics: 1996, 2000, and 2005

Characteristic	Grade 4			Grade 8			Grade 12		
	1996	2000	2005	1996	2000	2005	1996	2000	2005
Total	1.1	0.9	0.3	0.8	1.0	0.3	0.7	0.9	0.6
Sex									
Male	1.3	1.1	0.3	0.9	1.1	0.4	1.0	1.1	0.7
Female	1.1	1.0	0.3	0.9	1.1	0.3	0.8	1.0	0.6
Race/ethnicity									
White	0.9	0.7	0.3	0.8	0.8	0.2	0.9	1.2	0.6
Black	1.3	1.0	0.6	0.9	1.4	0.4	1.1	1.7	0.9
Hispanic	3.0	2.3	0.5	2.7	1.4	0.5	2.2	1.7	1.3
Asian/Pacific Islander	3.7	†	1.0	4.2	2.9	0.9	3.3	3.6	1.7
American Indian	11.9	6.9	1.9	3.5	6.7	4.0	7.5	3.6	5.3
Parents' education									
Less than high school	†	†	†	†	†	0.5	†	†	1.4
High school diploma or equivalent	†	†	†	†	†	0.5	†	†	0.9
Some college	†	†	†	†	†	0.4	†	†	0.7
Bachelor's degree or higher	†	†	†	†	†	0.3	†	†	0.6
Eligible for free or reduced-price lunch									
Eligible	1.7	1.3	0.3	1.6	1.1	0.3	†	†	†
Not eligible	0.9	1.1	0.3	0.9	1.0	0.3	†	†	†
Information not available	3.9	1.5	0.9	2.3	1.7	1.5	†	†	†

† Not applicable.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996, 2000, and 2005 Science Assessments, previously unpublished tabulation (January 2006).

Science Performance of Students in Grades 4, 8, and 12

Table S18-3. Standard errors for the average science score for public school 4th- and 8th-graders, by state: 1996, 2000, and 2005

State	Grade 4		Grade 8		
	2000	2005	1996	2000	2005
United States	1.1	0.3	0.9	1.1	0.3
Alabama	1.7	1.2	1.6	1.7	1.3
Arizona	1.8	1.5	1.6	1.3	0.9
Arkansas	1.3	1.2	1.3	1.2	1.0
California	3.0	0.6	1.7	1.8	0.7
Colorado	†	1.1	0.9	†	1.3
Connecticut	1.3	1.0	1.3	1.6	1.0
Delaware	†	0.6	0.8	†	0.6
Florida	†	0.6	1.6	†	1.2
Georgia	1.4	1.3	1.4	1.6	1.1
Hawaii	1.4	1.0	0.7	1.4	0.8
Idaho	1.4	0.8	†	1.0	1.0
Illinois	2.4	1.0	†	1.7	1.1
Indiana	1.5	1.0	1.4	1.4	1.3
Kentucky	1.2	0.9	1.2	1.2	0.9
Louisiana	1.8	1.1	1.6	1.5	1.5
Maine	1.1	0.9	1.0	0.9	0.7
Maryland	1.3	1.1	1.5	1.4	1.4
Massachusetts	1.4	1.0	1.4	1.1	1.0
Michigan	1.8	1.3	1.4	1.8	1.2
Minnesota	1.6	1.1	1.3	1.2	1.1
Mississippi	1.4	1.2	1.4	1.2	1.2
Missouri	1.2	1.0	1.2	1.2	1.2
Montana	1.5	0.9	1.2	1.4	0.8
Nevada	1.2	1.0	†	1.0	0.9
New Hampshire	†	0.9	†	†	0.9
New Jersey	†	1.3	†	†	1.2
New Mexico	1.8	1.0	1.0	1.5	0.9
North Carolina	1.3	0.9	1.2	1.4	1.0
North Dakota	0.9	0.5	0.8	1.1	0.6
Ohio	1.4	1.2	†	1.5	1.2
Oklahoma	1.3	1.1	†	1.1	1.3
Oregon	2.0	1.0	1.6	1.3	1.0
Rhode Island	1.3	1.1	0.8	0.9	0.7
South Carolina	1.3	1.1	1.5	1.4	1.1
South Dakota	†	0.5	†	†	0.7
Tennessee	1.4	1.1	1.8	1.5	1.2
Texas	1.8	0.7	1.8	1.7	0.8
Utah	1.3	0.8	0.8	1.0	0.7
Vermont	1.3	0.6	1.0	1.0	0.6
Virginia	1.4	1.0	1.6	1.0	1.1

See notes at end of table.

Science Performance of Students in Grades 4, 8, and 12

Table S18-3. Standard errors for the average science score for public school 4th- and 8th-graders, by state: 1996, 2000, and 2005—Continued

State	Grade 4		1996	Grade 8	
	2000	2005		2000	2005
Washington	†	1.0	1.3	†	0.8
West Virginia	1.3	0.8	0.9	1.1	0.8
Wisconsin	†	0.9	1.7	†	1.0
Wyoming	1.3	0.5	0.6	1.0	0.6

† Not applicable.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996, 2000, and 2005 Science Assessments, previously unpublished tabulation (January 2006).